SBI4U Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Lorenzo’s Oil (1992)**

This film is based on a true story about a young boy with a rare disorder called ALD (adrenoleukodystrophy). As his parents learn more about the disorder, they try to find a way to treat their son. The film touches on a lot of the topics covered in the SBI4U course: macromolecules, enzymes, structure of brain cells, and metabolic disorders; as well as patterns of inheritance (SBI3U).

Enjoy the film and answer the questions below:

1. As you watch the film, list some of the symptoms of ALD.

2. What is a neuron?

Using Figure 3 (p. 517) & Figure 5 (p. 518) in your textbook, label the *dendrites, cell body, axon,*

*myelin sheath,* and *nodes of Ranvier* on the diagram of a neuron below:



Describe what the axons of Lorenzo’s neurons would look like after several months of ALD.

3. What is the difference between saturated & unsaturated fatty acids? What kinds of fatty acids is Lorenzo’s

body unable to metabolize?

4. ALD is a sex-linked recessive disorder. Complete the table with the genotypes & phenotypes of the family

members.

XF = allele for normal fatty acid metabolism Xf = allele for abnormal fatty acid metabolism (ALD)

|  |  |  |
| --- | --- | --- |
|  | genotype: | phenotype: |
| Lorenzo | XfY | *has ALD* |
| Michaela (his mother) |  |  |
| Augusto (his father) |  |  |
| Aunt Dee (his mother’s sister) |  |  |

5. In Augusto’s sink model, there are 2 faucets. What does each faucet represent? What does Augusto

observe is the effect of “turning off” one of the faucets?

6. What did the paper clips that Augusto used represent? What did his dream reveal about the paper clips?

7. What is competitive inhibition? Describe how competitive inhibition occurs in ALD.

8. What happens to both Aunt Dee’s and Lorenzo’s fatty acid blood levels after consuming oleic-erucic acids

for a month?

9. Do some research to answer the questions below:

a. What protein is affected by the gene mutation in ALD?

b. How does this lead to the degeneration of the myelin in the neurons?

c. How effective is Lorenzo’s Oil as a treatment for ALD?

d. What happened to Lorenzo Odone since the film was released in 1992?

(Image of neuron from: http://www.clker.com/cliparts/f/U/V/h/M/F/neuron-black-and-white-hi.png)